1892

Analyses of commercial fertilizers and other substances useful to agriculture

William Carter Stubbs

SECOND SERIES.

No. 18.

BULLETIN

OF THE

AGRICULTURAL EXPERIMENT STATION,

WM. C. STUBBS, PH. D., Director and Official State Chemist.

ANALYSES OF

COMMERCIAL FERTILIZERS

AND

OTHER SUBSTANCES USEFUL TO AGRICULTURE.

ISSUED BY THE BUREAU OF AGRICULTURE.

H. C. NEWSOM, Commissioner.

BATON ROUGE, LA.
PRINTED AT THE TRUTH BOOK AND JOB OFFICE.
1892.

LOUISIANA STATE UNIVERSITY AND A. & M. COLLEGE.

BUREAU OF AGRICULTURE.

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The Bulletins and Reports will be sent free of charge to all farmers, by applying to Commissioner of Agriculture, Baton Rouge, La.

LIZERS, AS RENDERED TO COMMISSIONER OF AGRICULTURE, DEALERS AND MANUFACTURERS TO WHOM LICENSES HAVE BEEN ISSUED FOR SEASON 1891-92.

BY WHOM REPORTED.		BY WHOM MANUFACTURED.	WHERE MANUFACTURED.	WEIGHT OF PACKAGE, POUNDS.	NITROGEN, PER CENT.	PHOSPHORIC ACID.			POTASH, PER CENT.	CASH PRICE PER TON TO FARMERS.
	ADDRESS.					SOLUBLE, PER CENT.	REVERTED, PER CENT.	INSOLUBLE, PER CENT.		
. Mf'g Co..	New Orleans, La.	Standard Guano & Chem. Mf'g Co..	New Orleans, La	100 & 200	2 to 3	6 to 8	2 to 4	.....	2 to 3	.....
. Mf'g Co..	New Orleans, La	Standard Guano & Chem. Mf'g Co..	New Orleans, La	100 & 200	2 to 4	7 to 9	1 to 3	.....	2 to 3	.....
n. Mf'g Co..	New Orleans, La	Standard Guano & Chem. Mf'g Co..	New Orleans, La	100 & 200	2 to 2½	7 to 10	1 to 2	.....	2 to 3	.....
n. Mf'g Co..	New Orleans, La	Standard Guano & Chem. Mf'g Co..	New Orleans, La	100 & 200	4 to 5	.....	.....	21 to 24	.....	.....
n. Mf'g Co..	New Orleans, La	Standard Guano & Chem. Mf'g Co..	New Orleans, La	100 & 200	.....	15 to 18	1 to 3	.....	.....	.....
n. Mf'g Co..	New Orleans, La	Standard Guano & Chem. Mf'g Co..	New Orleans, La	100 & 200	.....	15 to 17	1 to 2	.....	.....	.....
n. Mf'g Co..	New Orleans, La	Standard Guano & Chem. Mf'g Co..	New Orleans, La	100 & 200	.....	.....	.....	.....	12 to 14	.....
n. Mf'g Co..	New Orleans, La	Standard Guano & Chem. Mf'g Co..	New Orleans, La	100 & 200	4 to 5	.....	.....	19 to 21	4 to 6	.....
n. Mf'g Co..	New Orleans, La	Standard Guano & Chem. Mf'g Co..	New Orleans, La	100 & 200	4 to 6	4 to 6	2 to 4	.....	5 to 7	.....
any.....	2012 St. Louis Ave., St. Louis, Mo ..	H. Studniczka & Co., and others ...	Chicago, Ill., and Kansas City, Mo..	100 & 200	2.06 to 2.47	9 to 11		1 to 2	.....	.....
any.....	2012 St. Louis Ave., St. Louis, Mo ..	H. Studniczka & Co., and others ...	Chicago, Ill., and Kansas City, Mo..	100 & 200	7 to 9	.....	.....	13 to 14	.....	.....
any.....	2012 St. Louis Ave., St. Louis, Mo ..	H. Studniczka & Co., and others ...	Chicago, Ill., and Kansas City, Mo..	100 & 200	3 to 4	.....	.....	25 to 30	.....	.....
any.....	2012 St. Louis Ave., St. Louis, Mo ..	H. Studniczka & Co., and others ...	Chicago, Ill., and Kansas City, Mo..	100 & 200	14 to 16	.....	.....	.....	.....	.....
any.....	2012 St. Louis Ave., St. Louis, Mo ..	H. Studniczka & Co., and others ...	Chicago, Ill., and Kansas City, Mo..	100 & 200	6 to 7	.....	.....	11 to 13	.....	.....
any.....	2012 St. Louis Ave., St. Louis, Mo ..	H. Studniczka & Co., and others ...	Chicago, Ill., and Kansas City, Mo..	100 & 200	3 to 4	9 to 10		1 to 2	.....	.....
any.....	2012 St. Louis Ave., St. Louis, Mo ..	H. Studniczka & Co., and others ...	Chicago, Ill., and Kansas City, Mo..	100 & 200	8 to 10	.....	.....	13	.....	.....
ar	2012 St. Louis Ave., St. Louis, Mo ..	H. Studniczka & Co., and others ...	Chicago, Ill., and Kansas City, Mo..	100 & 200	3 to 4	5 to 6		5 to 6	.....	.....
.....	2012 St. Louis Ave., St. Louis, Mo ..	H. Studniczka & Co., and others ...	Chicago, Ill., and Kansas City, Mo..	100 & 200	4 to 6	6 to 7		12 to 14	.....	.....
.....	2012 St. Louis Ave., St. Louis, Mo ..	H. Studniczka & Co., and others ...	Chicago, Ill., and Kansas City, Mo..	100 & 200	6 to 7	6 to 7		6 to 7	4 to 6	.....
.....	Baltimore, Md	Miller & Lippencott	Baltimore, Md	200	2	6.	4.	2.	1..	$32 00
pany..	103 Magazine St., New Orleans, La..	Planters' Fertilizer Mfg Co	New Orleans, La	100	3.5 to 4	7.5 to 9	.....	.....	2 to 3	23 75
mpany..	103 Magazine St., New Orleans, La..	Planters' Fertilizer Mfg Co	New Orleans, La	100	2.3 to 3	8 to 10	.....	.....	2.	22 50
mpany..	103 Magazine St., New Orleans, La..	Planters' Fertilizer Mfg Co	New Orleans, La	100	4 to 4.5	6 to 8	.....	.....	2 to 3	23 75
mpany..	103 Magazine St., New Orleans, La..	Planters' Fertilizer Mfg Co	New Orleans, La	100	4 to 5	7.	.....	.....	1 to 2	23 75
mpany..	103 Magazine St., New Orleans, La..	Planters' Fertilizer Mfg Co	New Orleans, La	100	4 to 5	6.	.....	.....	4 to 5	23 75
mpany..	103 Magazine St., New Orleans, La..	Planters' Fertilizer Mfg Co	New Orleans, La	100	.....	12.	2.00	0.25	.....	16 00
mpany..	103 Magazine St., New Orleans, La..	Planters' Fertilizer Mfg Co	New Orleans, La	100	.....	14.	1.75	0.30	.....	18 00
mpany..	103 Magazine St., New Orleans, La..	Planters' Fertilizer Mfg Co	New Orleans, La	100	.....	.....	.....	.....	13.	15 00
.....	Union Stock Yards, Chicago, Ill	N. W. Fertilizer Company	Union Stock Yards, Chicago, Ill....	117	4.12 to 5.76	.....	.....	10 to 15	.....	.....
pany....	Jackson, Miss	The Jackson Fertilizer Company....	Jackson, Miss	200	2.35	2.	4.	1.50	4.	.....
pany....	Jackson, Miss	The Jackson Fertilizer Company....	Jackson, Miss	200	1.80	3.50	4.50	1.50	2.	.....
pany....	Jackson, Miss	The Jackson Fertilizer Company....	Jackson, Miss	200	1.80	5.00	2.	1.44	3.	.....
pany....	Jackson, Miss	The Jackson Fertilizer Company....	Jackson, Miss	200	1.30	3.00	5.	1.50	2.	.....
npany....	Jackson, Miss	The Jackson Fertilizer Company....	Jackson, Miss	200	.....	7.15	4.85	1.80	.....	.....
mpany....	Jackson, Miss	The Jackson Fertilizer Company....	Jackson, Miss	.....	.....	.....	.....	.....	12.	.....
mpany....	Jackson, Miss	The Jackson Fertilizer Company....	Jackson, Miss			—Mixed to Order—				.....
ny.....	Atlanta, Ga	George W. Scott & Company.....	Atlanta, Ga	200	2 to 3	7 to 8	2 to 3	1 to 2	}	.....
any.....	Atlanta, Ga	George W. Scott & Company.....	Atlanta, Ga	200	2 to 3	7 to 8	2 to 3	1 to 2	} 1 to 2	.....
any.....	Atlanta, Ga	George W. Scott & Company.....	Atlanta, Ga	200	.....	11 to 12	2 to 3	1 to 2	}	.....
any.....	Meridian, Miss	Southern Chemical Company.....	Meridian, Miss	200	.....	10 to 13	2 to 3	1.	.....	.....
any.....	Meridian, Miss	Meridian Fertilizer Company.....	Meridian, Miss	200	2½ to 4	9 to 11	2 to 3	1 to 3	2½ to 4	.....
any.....	Meridian, Miss	Meridian Fertilizer Company.....	Meridian, Miss	200	2½ to 4	9 to 11	2 to 3	1 to 3	2½ to 4	.....
.....	36 Carondelet street, New Orleans ..	Thompson & Edwards' Fertilizer Co	Union Stock Yards, Chicago	100 & 200	7 to 8	.....	4 to 6	8	.....	.....
.....	36 Carondelet street, New Orleans...	Thompson & Edwards' Fertilizer Co	Union Stock Yards, Chicago	.....	6 to [illegible]	.....	.....	10 to 4	.....	.....
.....	36 Carondelet street, New Orleans...	Thompson & Edwards' Fertilizer Co	Union Stock Yards, Chicago	.....	3 to [illegible]	.....	6 to 9	9	½ to 2½	.....
.....	36 Carondelet street, New Orleans ..	Thompson & Edwards' Fertilizer Co	Union Stock Yards, Chicago	.....	3 to [illegible]	.....	6 to 9	9	8 to 9	.....
.....	36 Carondelet street, New Orleans...	Thompson & Edwards' Fertilizer Co	Union Stock Yards, Chicago	.....	2 to 3	10	4	4	.....	.....
.....	35 Carondelet street, New Orleans...	Thompson & Edwards' Fertilizer Co	Union Stock Yards, Chicago	.....	3 to 4	.....	.....	22 to 26	.....	.....
Company ...	Baton Rouge, La	Capital City Oil Mills Company	Baton Rouge, La	100 & 200	3.93	3.84	3.07	0.90	1.95	.....
ny.....	Union Stock Yards, Chicago, Ill.....	N. W. Fertilizer Company.....	Union Stock Yards, Chicago.....	200	2.05 to 2.90	2 to 4	6 to 8	2 to 3	54 to 1.08	.....
ny.....	Union Stock Yards, Chicago, Ill.....	N. W. Fertilizer Company.....	Union Stock Yards, Chicago.....	200	1.65 to 2.50	2 to 4	6 to 8	2 to 3	54 to 1.08	.....
ny.....	Union Stock Yards, Chicago, Ill.....	N. W. Fertilizer Company.....	Union Stock Yards, Chicago.....	.....	1.65 to 2.50	2 to 4	6 to 8	2 to 3	54 to 1.08	.....
ny.....	Union Stock Yards, Chicago, Ill.....	N. W. Fertilizer Company.....	Union Stock Yards, Chicago	.....	1.65 to 2.50	2 to 4	6 to 8	2 to 3	54 to 1.08	.....
rty & Bro....	Atlanta, Ga	Adair, McCarty & Bro	Atlanta, Ga	200	1.85	5.50	2.50	2.	1.	.....
y & Bro....	Atlanta, Ga	Adair, McCarty & Bro	Atlanta, Ga	200	1.85	5.50	2.50	2.	1.	.....
rty & Bro....	Atlanta, Ga	Adair, McCarty & Bro	Atlanta, Ga	200	2.00	6.	3.	2.	1.	.....
rty & Bro....	Atlanta, Ga	Adair, McCarty & Bro	Atlanta, Ga	200	1.85	5.50	2.50	2.	1.	.....
rty & Bro....	Atlanta, Ga	Adair, McCarty & Bro	Atlanta, Ga	200	.85	6.50	3.50	2.	1.	.....
rty & Bro....	Atlanta, Ga	Adair, McCarty & Bro	Atlanta, Ga	200	.....	6.50	3.50	2.	1½	.....
rty & Bro....	Atlanta, Ga	Adair, McCarty & Bro	Atlanta, Ga	200	.....	6.50	3.50	2.	.....	.....
rty & Bro....	Atlanta, Ga	Adair, McCarty & Bro	Atlanta, Ga	200	.....	6.50	3.50	2.	.....	.....
.....	New Orleans, La	Imported by Carib Guano Company	Baltimore, Md	200						
ompany	Baltimore, Md	The Raisin Fertilizer Company.....	Baltimore, Md	200	3.	6.	3	1.	2.	.....
ompany	Baltimore, Md	The Raisin Fertilizer Company.....	Baltimore, Md	.....	2.	6.	3	1.	1¾	.....
.....	Crystal Springs, Miss	Hurxthall & Marback	Carroll county, Tex	100	4.1	1.73	4.96	8.99	1.13	.....

NAME OF FERTILIZER OR CHEMICAL.	NAM
Stern's Ammoniated Raw Bone Superphosphate	Standard Guano &
Standard Soluble Ammoniated Guano	Standard Guano &
Champion Farmer's Choice	Standard Guano &
Ground Bone	Standard Guano &
Dissolved Bone	Standard Guano &
Acid Phosphate	Standard Guano &
Kainite	Standard Guano &
Fruit Tree Fertilizer	Standard Guano &
Vegetable Fertilizer	Standard Guano &
Our Celebrated Standard Sugar Cane Fertilizer	H. Studniczka & C
[illegible] Grade Bone and Blood	H. Studniczka & C

OFFICE BUREAU OF AGRICULTURE,
Baton Rouge, La., Nov. 1, 1892.

To His Excellency, Murphy J. Foster, Governor of Louisiana and President of the State Bureau of Agriculture:

SIR—In compliance with the provisions of Act 54 of 1888 and Act 131 of 1890, herein please find the analyses made by Dr. Wm. C. Stubbs, Director and Official Chemist; also a list of the Commercial Fertilizers sold in the State during the season of 1891–'92; their guaranteed analyses, names of dealers to whom licenses have been issued, etc. I also append the same with regard to Paris Green, as required by a recent act. The prices of fertilizers remain about the same as last year and no material change need be expected. Other analysis of an agricultural nature are given in this report for the benefit of farmers and planters.

H. C. NEWSOM,
Commissioner, Bureau of Agriculture.

LOUISIANA STATE UNIVERSITY AND A. AND M. COLLEGE,
OFFICE OF EXPERIMENT STATIONS, BATON ROUGE, LA.

H. C. Newsom, Commissioner of Agriculture, Baton Rouge, La.:

DEAR SIR—I hand you herewith the Analyses of Commercial Fertilizers, Paris Green and various substances useful to agriculture, made in the Station Laboratories since our last season's report. I have also included the laws regulating the sale of these materials, and would request that the whole of this matter be published in bulletin form.

Respectfully submitted,
WM. C. STUBBS.
Director and State Chemist.

REPORT OF THE DIRECTOR AND STATE CHEMIST.

The analyses of Commercial Fertilizers contained in the report are of four kinds:

1. Of samples selected at the discretion of the Commissioner of Agriculture.

2. Of samples drawn by the purchaser, *under* regulations prescribed by the Commissioner of Agriculture.

The above are required by law.

3. Of samples used by the Stations.

4. Of samples sent by private parties.

While the Station is not required by law to work for private parties, yet all samples sent by individual citizens of the State will be analyzed without charge; *provided*, the means of the Station will permit; *provided*, always, that in the discretion of the Director such analyses will be conducive to public welfare.

The Fertilizer Law, in part, is herein inserted for the guidance of the public. Under it, every citizen of the State is amply protected from fraud and imposition by unscrupulous dealers, and there exists absolutely no cause for distrust in the purchase of commercial fertilizers, if the farmer will but claim the protection afforded him. The sellers of good wares are also protected, as ample facilities are afforded them of properly advertising their goods.

Only cotton seed meal, land plaster, salt, ashes, lime, and bones not specially treated, are exempt from the provisions of this law.

Bones ground to a powder by machinery, as well as *bones treated with acid*, are included in the law, since they *have been specially treated.*

The following is the law:

SEC. 2. Be it further enacted, etc., That it shall be the duty of any manufacturer or dealer in commercial fertilizers, before the same are offered for sale in this State, to submit to the Commissioner of Agriculture a written or printed statement setting forth: First. The name and brand under which said fertilizer is to be sold, the number of pounds contained or to be contained in the package in which it is to be put upon the market for sale, and the name or names of the manufacturers, and the place of manufacture. Second. A statement setting forth the amount of the named ingredients which they are willing to guarantee said fertilizer to contain. (1) Nitrogen, (2) Soluble Phosphoric Acid, (3) Reverted Phosphoric Acid, (4) Insoluble Phosphoric Acid, (5) Potash. Said statement, so to be furnished shall be considered as constituting a guarantee to the purchaser that every package of such fertilizer contains not less than the amount of each ingredient set forth in the statement. This shall, however, not preclude the party making the statement from setting forth any other ingredient which his fertilizer may contain, which additional ingredient shall be considered as embraced in the guarantee above stated.

SEC. 3. Be it further enacted, etc., That every person proposing to deal in commercial fertilizers shall, after filing the statement above provided for, with the Commissioner of Agriculture, receive from said Commissioner of Agriculture a certificate stating that he has complied with the foregoing section, which certificate shall be furnished by the Commissioner without any charge therefor.

That the said certificate, when furnished, shall authorize the party receiving the same to manufacture for sale in this State, or to deal in this State, in commercial fertilizers. That no person who has failed to file the statement aforesaid and to receive the certificate of authority aforesaid, shall be authorized to manufacture for sale in this State, or to deal in this State in commercial fertilizers. And any person so manufacturing for sale in this State, or so dealing, without having filed the aforesaid statement, and receiving the certificate aforesaid, shall be liable for each violation to a fine not exceeding one thousand dollars, which

fine shall be recoverable before any court of competent jurisdiction, at the suit of the Commissioner of Agriculture or of any citizen, and shall be disposed of as hereafter provided.

SEC. 4. Be it further enacted, etc., That it shall be the duty of the Board of Agriculture, or its Commissioner, at the opening of each season, to issue and distribute circulars, setting forth the brands of fertilizers sold in this State, their analyses as claimed by their manufacturers or dealers, and their relative, and, if known, their commercial value.

SEC. 5. Be it further enacted, etc., That it shall be the duty of the Commissioner of Agriculture, under the regulations of the said Bureau, to cause to be prepared tags of suitable material with proper fastenings for attaching the same to packages of fertilizers, and to have printed thereon the word, "Guaranteed," with the year or season in which they are to be used and a fac simile of the signature of said Commissioner. The said tags shall be furnished by said Commissioner to any dealer in, or manufacturer of, commercial fertilizers, who shall have complied with the foregoing provisions of this act, upon the payment by said dealer or manufacturer, to said Commissioner, of fifty cents for a sufficient number of said tags to tag a ton of such commercial fertilizer.

SEC. 6. Be it further enacted, etc., That it shall be the duty of every person, before offering for sale any commercial fertilizers in this State, to attach or cause to be attached, to each bag, barrel or package thereof, one of the tags herein before described, designating the quantity of the fertilizer in the bag, barrel or package to which it is attached, Any person who shall sell or offer for sale, any package of commercial fertilizer which has not been tagged as herein provided, shall be guilty of a misdemeanor and on conviction thereof, shall be fined in the sum of two hundred and fifty dollars for each offense, and the said person shall be, besides, liable to a penalty of one hundred and fifty dollars for each omission, which penalty may be sued for either by the Commissioner of Agriculture, or by any other person for the uses hereinafter declared. Any person who shall counterfeit or use a counterfeit of the tag, prescribed by this act,

knowing the same to be counterfeited, or who shall use them the second time, shall be guilty of a misdemeanor, and on conviction thereof shall be fined in a sum not exceeding five hundred dollars, one-half of which fine shall be paid to the informer which fine may be doubled or trebled at each second or third conviction, and so on progressively, for subsequent convictions.

SEC. 7. Be it further enacted, etc., That all fertilizers or chemicals for manufacturing or composting the same, offered for sale or distribution in this State, shall have printed upon, or attached to each bag, barrel or package, in such a manner as the Commissioner of Agriculture may, by regulation, establish, the true analysis of such fertilizer or chemical as claimed by the manufacturer, showing the per cent. of valuable ingredients such fertilizers or chemicals contain.

SEC. 8. Be it further enacted, etc., That the Commissioner of Agriculture may obtain, or cause to be obtained, at his discretion, fair samples of all fertilizers sold or offered for sale in this State, from manufacturers or dealers, and shall have them analyzed by the official chemist, and shall publish the analysis for the information of the public.

SEC. 9. Be it further enacted, etc., That it shall be the duty of every person who sells a lot or package of commercial fertilizer, upon the request of the purchaser, to draw from same, and in the presence of the purchaser or his agent, a fair and correct sample, in such a manner as the Commissioner of Agriculture may, by regulation, establish.

SEC. 10. Be it further enacted, etc., That the copy of the official chemist's analysis of any fertilizer or chemical, certified to by him, shall be admissible as evidence in any court of this State, on the trial of any issue involving the merits of said fertilizer.

SEC. 11. Be it further enacted, etc., That the Bureau of Agriculture shall adopt needful rules and regulations providing for the collection of the money arising from the sale of tags, or from fines imposed under this act, and shall require the same to be deposited with the Treasurer of the State, etc.

SEC. 16. Be it further enacted, etc., That the terms, "commercial fertilizers," or "fertilizers," where the same are used in this act shall not be held to include lime or land plaster, cotton seed meal, ashes or common salt, or raw bone not specially treated.

The following, taken from a previous Bulletin, is herein inserted as explanatory of the terms to be subsequently used:

COMMERCIAL FERTILIZERS.

The ingredients which give value to all commercial fertilizers are: 1st, Nitrogen (Ammonia); 2d, Phosphoric Acid; 3d, Potash. A fertilizer may contain one, two or all of these ingredients. When all are present, the compound is usually styled a "*complete* manure;" when only one or two are present it is a "*partial* manure."

Partial manures may consist of, (1) Nitrogen (Ammonia) alone; (2) Phosphoric Acid alone; (3) Potash alone; (4) Nitrogen (Ammonia) and Phosphoric Acid; (5) Phosphoric Acid and Potash; (6) Nitrogen (Ammonia) and Potash. No. 6 is rarely found in Southern markets; the others are common wares.

(1) NITROGEN MANURES.

Nitrogen is the most costly ingredient in manures. It is offered to the trade in three forms:

a—Mineral Nitrogen—in Nitrate of Soda and Sulphate of Ammonia.

b—Animal Nitrogen—in Dried Blood, Tankage, Azotin, Ammonite, Fish Scrap and Leather.

c—Vegetable Nitrogen—in Cotton Seed, Cotton Seed Meal, Linseed Meal, Castor Pomace and Peat.

Blood, Tankage, Fish Scraps and Oil Meals are highly active fertilizers, while Leather and Peat are slowly available. The result of decomposition of organic forms of Nitrogen is either Ammonia or Nitric Acid; fourteen parts of Nitrogen yielding seventeen parts of Ammonia, or twenty-eight parts of Nitrogen forming, by nitrification, one hundred and eight parts Nitric

Acid. The mineral forms of Nitrogen are highly prized in the North and England; but in the South, on account of the ease with which they are washed from the soil, they should be used with great care.

Cotton Seed Meal contains, besides Nitrogen, small amounts of Phosphoric Acid and Potash. A fair sample of meal, *free from hulls*, should yield 7 per cent. Nitrogen, 3 per cent. Phosphoric Acid, and 2 per cent. Potash. This is a cheap source of Nitrogen, and experiments have demonstrated that it is, perhaps, the best form for Southern agriculture. In buying it, however, *caution* is necessary to see that it is well *decorticated*, *i. e.*, free from hulls. Samples containing 30 per cent. of hulls have been found on the market.

(2) PHOSPHORIC ACID MANURES.

These are generally phosphatic rocks treated with Sulphuric Acid. Sometimes pure bones or bone black, or bone ash are treated with the same acid, and the resulting mixtures styled Dissolved Bones or Superphosphates. When made from phosphatic rock, bone black or bone ash, they contain only Phosphoric Acid. When pure bones are used, 3 to 5 per cent. of Ammonia is also found. These phosphatic manures usually contain their Phosphoric Acid in different forms. Some of it is readily soluble in water, and is highly available as plant food; some of it is only soluble in acids, and is, therefore, only slowly, if at all, available to plants, while another portion is intermediate in solubility between the water soluble and the acid soluble. The Chemist uses Citrate of Ammonia to dissolve this form; and hence it is denominated as Citrate Soluble Phosphoric Acid. It is believed by many that this form of Phosphoric Acid has resulted from a chemical action of the water soluble upon the acid soluble, and hence it is often called *"reverted," "reduced,"* etc. The water soluble is readily available on all soils and by all plants; the citrate soluble in soils containing vegetable matter is believed to be available to many plants, while the acid soluble is immediately useful only to certain plants and upon certain soils. The water soluble and citrate soluble are usually

taken together and called Available Phosphoric Acid. In buying phosphatic manures, preference should be given, first to the water soluble, then to the citrate soluble. If there is much Acid Soluble Phosphoric Acid present, inquiry should be at once made as to its origin, for the Insoluble Phosphoric Acid from bones is more easily transferred into plant food than that from rock. These three forms of Phosphoric Acid are usually called "soluble," "reduced" and "insoluble."

(3) POTASH MANURES.

These are now obtained almost exclusively from Leopoldshall and Stassfurth, Germany, and are largely sold in this country as—

(*a*) Kainite, which is a crude product of the mines, and consists of Potash, Magnesia, Soda, Sulphuric Acid and Chlorine. This form of Potash is now extensively used in the South, either in the compost of stable manure, cotton seed and Acid Phosphate, or mixed with Acid Phosphate and cotton seed meal to form a complete manure. Whether our soil needs Potash can only be determined experimentally, After careful experimentation the right quantities can be easily determined. It is a cheap and excellent source of Potash.

(*b*) Sulphate of Potash, a refined product, containing a large amount of Potash in a very desirable form, is extensively used in some countries, upon certain crops, notably tobacco and Irish potatoes.

(*c*) Muriate of Potash, another refined product, containing a large per centage of Potash. This salt furnishes Potash in the cheapest form.

(4) NITROGEN AND PHOSPHORIC ACID.

Formerly bones, treated with Sulphuric Acid, were frequently found upon our market; recently, however, Potash, in some form, has been added to them. Whether this addition has been made by the demands of the soil or by the inclination of the manufacturers, is yet to be determined. Potash is the cheapest ingredient in fertilizers, and any demand for it is readily met. At present we find on our markets a manure of this class which

is being extensively used under sugar cane, viz: *Tankage.* This is a variable goods, containing usually from 4 to 12 per cent. of Nitrogen, and from 6 to 20 per cent. Phosphoric Acid. This latter is in the insoluble form; but, being of the animal origin, upon certain soils is slowly available if finely pulverized.

(5) PHOSPHORIC ACID AND POTASH.

To make Acid Phosphates suitable for composting, many dealers have recently added Potash. This addition necessarily lowers the percentage of Phosphoric Acid. Manufacturers in and around Charleston, S. C, have adopted the custom of calling this class of goods "Acid Phosphates," and those which contain no Potash "Dissolved Bones." These are extensively used for the compost of stable manure and cotton seed.

(6) NITROGEN AND POTASH.

The great and crying want of Southern soils is Phosphoric Acid; hence no manure without it has hitherto met with favor. Accordingly this class of manures is rarely met with in the South.

COMPLETE MANURES

are those which contain Nitrogen, Phosphoric Acid and Potash. For different crops these ingredients should exist in different proportions.

Before purchasing any fertilizer the farmer should study well the wants of his soil and his crop and buy accordingly.

Before buying, get from the dealer replies to the following questions:

How much Soluble Phosphoric Acid do you guarantee?

How much Reverted Phosphoric Acid do you guarantee?

How much Ammonia do you guarantee?

How much Potash do you guarantee?

In a plain Acid Phosphate at least 12 per cent. available Phosphoric Acid should be guaranteed. In cane fertilizers, 3 per cent. Ammonia and 7 per cent. Phosphoric Acid, and in cotton fertilizers 2 per cent. Ammonia and 8 per cent. of Phosphoric Acid should be found.

VALUATION OF FERTILIZERS.

The commercial value of a fertilizer is regulated by the prices demanded in commerce for the different forms of the three ingredients, Nitrogen (Ammonia), Phosphoric Acid and Potash. These prices fluctuate according to the demand and supply. In the North, Nitrogen is assigned a separate valuation for each of its forms—that in Nitrates and Ammonia Salts receiving the highest figure, and in leather and peat the lowest.

In Connecticut or Massachusetts, a determination of the forms in which this ingredient occurs must be made before its commercial value can be calculated. All the forms of Nitrogen have heretofore been considered of equal money value in the South, and but one price assigned. This, of course, precludes the existence of Nitrogen in form of leather dust, or powdered horn, forms regarded as unavailable and of little money or agricultural value.

The soluble and reverted forms of Phosphoric Acid have together been styled as "available," and assigned one value. The insoluble Phosphoric Acid has received no valuation. All forms of Potash soluble in water have been regarded as of equal value.

At a recent convention of Southern State Chemists, the following tariff of prices was continued :

Ammonia, 16 cents per pound.
Nitrogen, 19½ cents per pound.
Soluble Phosphoric Acid, 7½ cents per pound.
Reverted Phosphoric Acid, 7½ cents per pound.
Potash (soluble in water), 5 cents per pound.

The writer deems it best, for the sake of harmony in State valuations, to adopt this tariff, though he wishes to dissent from the opinion that Reverted Phosphoric Acid is of equal value with the soluble form, or that Nitrogen is of the same money value in all its forms.

The above are commercial values, that is, what these ingredients, properly mixed and sacked, can be purchased for in the markets of the South. The above tariff, when applied to fertil-

izers bought in New Orleans, will be found to give values beyond the actual selling prices. Good cotton seed meal contains 7 per cent. Nitrogen, 3 per cent. Phosphoric Acid and 2 per cent. Potash, and estimating its value only on its Nitrogen content, there will be obtained for one ton 140 pounds of Nitrogen at 19½ cents—$27.30. It is well known that this fertilizer could be bought at any time in the year, in New Orleans, at about $20 per ton.

This form of Nitrogen comes entirely from the South, while all others are products of Northern and foreign climes. Home consumption takes only a small portion of the output of our mills, the greater part finding its way to the North and to Europe.

This export demand regulates the price, and hence we have the cheapest form of Nitrogen presented to us in our own home product, viz: Cotton Seed Meal.

By applying the above to a fertilizer of known composition and comparing the result with the actual selling price, the consumer can easily tell whether he is getting value received.

HOW TO COMPUTE THE VALUE OF A FERTILIZER.

A fertilizer is purchased whose guaranteed analysis recorded on the sack, is as follows:

Nitrogen, 3 per cent.
Soluble Phosphoric Acid, 6 per cent.
Reverted Phosphoric Acid, 4 per cent.
Potash, 2 per cent.

What is its commercial value?

IN ONE TON WE HAVE:

3 per cent. Nitrogen	60 pounds at 19½ cents.	$11	70
6 per cent. Soluble Phosphoric Acid	120 pounds at 7½ cents.	9	00
4 per cent. Reverted Phosphoric Acid	80 pounds at 7½ cents.	6	00
2 per cent. Potash	40 pounds at 5 cents.	2	00
Commercial value per ton		$28	70

By comparing the above with the amount paid, the consumer can easily calculate whether he has paid too much.

The work done in the Laboratory of the Experiment Station since the last report, in the department of analysis of fertilizers

and other substances directly and indirectly relating to agriculture, comprises the following:

6 Ammoniated Superphosphates and Guanos.
7 Acid Phosphates.
6 Cotton Seed Meals.
6 Tankage.
1 Bone Meal.
9 Phosphates.
1 Fish Scrap.
1 Dried Blood.
1 Sulphate of Ammonia.
1 Nitrate of Soda.
1 Nitrate of Potash.
1 Kainite.
1 Sulphate of Potash.
1 Muriate of Potash.
1 Cotton Seed Hull Ashes.
1 Land Plaster.
1 Paris Green.
1 Poudrette.
1 Bat Manure.
1 Water.

Total, 49.

In addition to the above, quite a large number of qualitative tests have been made upon substances forwarded for examination.

AMMONIATED SUPERPHOSPHATES AND GUANOS.

Ammoniated Superphosphates and Guanos constitute the chief bulk of the fertilizers consumed by the farmers of the Southern States. The term "complete fertilizer" is often applied to them on account of the fact that they contain all three of the most essential fertilizing constituents, and their range of adaptability is, in consequence, much greater than that of any of the partial manures. As might be supposed, there is great diversity in the composition of fertilizers of this class, both as regards the proportions of their fertilizing ingredients and also

the forms in which they are supplied, the quantities of these essential constituents being so regulated as to correspond with the manufacturer's ideas as to the demands of our principal crops.

AMMONIATED SUPERPHOSPHATES.

Station No. 399—Cotton Fertilizer, sent by Caddo Fertilizer Company, Shreveport, La.

Station No. 400—Corn and Cane Fertilizer, sent by Caddo Fertilizer Company, Shreveport, La.

Station No. 409—Corn and Cane Fertilizer, sent by Caddo Fertilizer Company, Shreveport, La.

Station No. 410—Cotton Fertilizer, sent by Caddo Fertilizer Company, Shreveport, La.

Station No. 411—Soluble Pacific Guano, sent by W. B. Schmidt, New Orleans, La.

Station No. 430—Cotton and Corn Fertilizer, sent by Planters' Fertilizer Manufacturing Company, New Orleans, La.

ANALYSES OF AMMONIATED SUPERPHOSPHATES.

Station Number.	PHOSPHORIC ACID.				Nitrogen.	Equivalent to Ammonia.	Potash.
	Soluble.	Reverted.	Insoluble.	Total.			
399	7.93	2.42	1.04	11.39	2.34	2.84	2.02
400	4.92	2.18	1.05	8.15	3.09	3.75	3.33
409	4.90	1.76	0.94	7.60	3.70	4.49	2.50
410	7.95	2.07	1.05	11.07	2.19	2.66	2.16
411	7.03	1.37	3.29	11.69	2.84	3.44	2.12
430	7.01	0.74	0.62	8.37	2.65	3.22	2.22

ACID PHOSPHATES.

Acid Phosphates, or Superphosphates, contain only one fertilizing constituent of value, viz: Phosphoric Acid, but this ingredient is almost invariably present in three forms. Fertilizers of this class are produced by the action of sulphuric acid upon insoluble phosphates, a large proportion of the Phosphoric Acid being thus rendered soluble, and consequently much more readily assimilable by the plant.

Where a sufficient amount of sulphuric acid has been employed, little or no insoluble phosphoric acid should be present in the product, though reverted phosphoric acid is invariably contained in small proportions, at least.

While the value of the insoluble form of Phosphoric Acid varies with its source, that from bone being superior to that found in Phosphate rock, the soluble and reverted forms, resulting from the treatment of these phosphates with acid, are of equal agricultural value, whatever the source.

Station No. 397—Acid Phosphate, sent by Caddo Fertilizer Company, Shreveport, La.

Station No. 398—Acid Phosphate, sent by Caddo Fertilizer Company, Shreveport, La.

Station No. 408—Dissolved Bone, sent by Caddo Fertilizer Company, Shreveport. La.

Station No. 412—Home made Acid Phosphate, sent by F. W. Nicholls, Thibodaux, La.

Station No. 429—Acid Phosphate, sent by Planters' Fertilizer Manufacturing Company, New Orleans, La.

Station No. 8—High grade Acid Phosphate, sent by Sugar Experiment Station, New Orleans, La.

Station No. 9—Low grade Acid Phosphate, sent by Sugar Experiment Station, New Orleans, La.

ANALYSES OF ACID PHOSPHATES.

Station Number.	Soluble Phosphoric Acid.	Reverted Phosphoric Acid.	Insoluble Phosphoric Acid.	Total Phosphoric Acid.
397	15.99	0.79	1.58	18.36
398	15.73	1.41	1.69	18.83
408	15.75	1.03	1.15	17.93
412	12.27	10.45	4.88	17.60
429	12.22	0.84	0.32	13.38
8	36.14	8.02	0.37	44.53
9	12.79	2.62	0.18	15.59

In addition to the above, a sample of fertilizer (Station No. 268), sent by Mr. W. B. Schmidt, New Orleans, La., showed upon analysis, the following extremely low Phosphoric Acid content:

Soluble Phosphoric Acid	1.03 per cent.
Reverted Phosphoric Acid	0.28 per cent.
Insoluble Phosphoric Acid	1.45 per cent.
Total	2.76 per cent.

COTTON SEED MEAL.

This, to the Southern farmer, is the cheapest and most easily obtainable form of Nitrogen. Although it has acquired an extensive use as a fertilizer throughout the whole State, it has been exempted from the operations of the Fertilizer law by virtue of its employment as a feeding stuff.

On account of the presence of quite appreciable quantities of hulls in many samples of meal found upon the market, it is very essential that great care should be observed in the purchase of this article. Hulls can easily be detected by the non-homogeneous appearance of the meal containing them and also by passing a small quantity of the meal through an ordinary sifter.

The best, undamaged meal, has a bright yellow color and is dry and pulverulent.

The damaged meal is invariably darker in color, and though rendered unfit for use as a feed stuff, does not lose any of its value for fertilizing purposes.

The commercial value of Cotton Seed Meal, reckoned by the schedule of fertilizer valuations, is largely above the actual selling price.

COTTON SEED MEAL.

Station No. 14—Sent by Sugar Experiment Station, New

Station No. 280—Sent by George Sarpy, New Orleans, La.

Station No. 401—Sent by Planters' Fertilizer Manufacturing Company, New Orleans, La.

Station No. 402—Sent by Planters' Fertilizer Manufacturing Company, New Orleans, La.

Station No. 403—Sent by Planters' Fertilizer Manufacturing Company, New Orleans, La.

Station No. 404—Sent by Mr. John Hill, Jr., Port Allen, La.

ANALYSES OF COTTON SEED MEAL.

Station Number.	Nitrogen.	Equivalent to Ammonia.	Phosphoric Acid.	Potash.
14	6.12	7.43	4.62	....
280	6.44	7.82	4.48	....
401	6.88	8.35	4.25	2.29
402	7.00	8.50	3.98	1.48
403	6.58	7.99	3.24	1.99
404	5.55	6.74	3.07	1.18

TANKAGE.

This fertilizer has rapidly grown in favor since its introduction into this State and is each year becoming more largely in demand. It consists chiefly of waste products from slaughter-houses, and is a mixture of partly cooked bone and meat, deposited in tanks in which the refuse from the butcher is treated to separate the grease. It, ordinarily, contains good percentages of both Nitrogen and Phosphoric Acid, the proportions of each, in general, varying almost inversely as the quantity of the other. The relative proportions of Nitrogen and Phosphoric Acid having such wide limits of variation, this class of goods, of course, exhibits a correspondingly wide range in value for fertilizing uses. When a considerable excess of bone is present, the proportion of Phosphoric Acid is largely above that of the Nitrogen, while with an excess of meat, the content of Nitrogen becomes large and that of Phosphoric Acid becomes comparatively small. In the latter case, the action of both ingredients has been found to be more satisfactory. The Phosphoric Acid in the Tankage, being derived principally from bone, is chiefly the insoluble form, and its value is largely dependent upon the degree of fineness of division of the particles, a well pulverized sample responding more readily to the needs of the plant. Purchasers of fertilizers of this class should always buy upon a guarantee of definite percentages of Nitrogen and Phosphoric Acid, as their varying composition renders almost indispensable a knowledge of the proportions of their constituents.

TANKAGE.

Station No. 15—Sent by Sugar Experiment Station, New Orleans, La.

Station No. 269—Sent by L. S. Clarke, Pattersonville, La.

Station No. 405—Sent by McCall & Legendre, McCall Postoffice, La.

Station No. 406—Sent by L. S. Clarke, Pattersonville, La.

Station No. 414—Sent by L. S. Clarke, Pattersonville, La.

Station No. 415—Sent by L. S. Clarke, Pattersonville, La.

ANALYSES OF TANKAGE.

Station Number.	Nitrogen.	Equivalent to Ammonia.	Phosphoric Acid.
15	4.90	5.95	7.00
269	7.42	9.01	20.30
405	5.86	7.11	14.48
406	5.00	6.07	18.04
414	4.39	5.33	19.39
415	4.47	5.43	19.46

BONE MEAL.

Bones pulverized to a greater or less degree of fineness are variously sold as "Bone Meal," "Bone Dust," "Ground Bone," etc., and in some countries are quite in demand for fertilizing purposes. They have, as yet, acquired but little favor in the South, and but few brands are upon the market in this section. As their utility is largely dependent upon the state of division of their particles, both a mechanical and chemical examination are necessary in determining their value.

In addition to the Phosphoric Acid found in Bone Black and Bone Ash, the Ground Bone contains a good proportion of Nitrogen derived from the gelatinous matter present in the raw substance.

Station No. 13—Sent by Sugar Experiment Station, New Orleans, La., showed the following results upon analyses:

Phosphoric Acid ..... 7.11 per cent.
Nitrogen ..... 3.22 per cent.
Equal to Ammonia ..... 3.91 per cent.

PHOSPHATES.

Under this head are included Slag Meal, Bone Black, Floats and various other natural Phosphates.

Slag meal is obtained by pulverizing the phosphoretic slag resulting from the Thomas-Gilchrist process for removing phosphorus from pig iron. When ground it assumes quite a pulverulent form, and this fine state of division renders it more readily available when employed as a fertilizer. It contains large proportions of the phosphates of lime, admixed with lime, and the beneficial results attendant upon its employment have created quite a demand for it in some European countries.

Bone Black is the charred residue resulting from the heating of bones in retorts out of contact with air. It is extensively employed as a decolorizing agent in sugar refineries, and when exhausted or "spent" is sold to the fertilizer manufacturer for treatment with acid. Unless specially treated, preparatory to application as a fertilizer, its action will be quite slow and unsatisfactory on account of the obstacles offered by the carbon coatings of its granules to the disintegrading and dissolving influences of the soil.

Charleston Floats are obtained by pulverizing to impalpability, by means of the "Duc" atomizer, the crude Charleston phosphate rock. Its Phosphoric Acid is almost entirely of the insoluble and least assimilable form, though by virtue of its fine state of division becomes slowly available as plant food.

In addition to the South Carolina phosphatic rock, various crude phosphates are obtained from islands of the Caribbean Sea and adjacent waters, and within the last few years large deposits in Florida have been discovered and are now being worked.

PHOSPHATES.

Station No. 10—South Carolina Floats, sent by Sugar Experiment Station, New Orleans, La.

Station No. 11—Slag Meal, sent by Sugar Experiment Station, New Orleans, La.

Station No. 17—Dissolved Bone Black, sent by Sugar Experiment Station, New Orleans, La.

Station No. 19—Bone Black, sent by Sugar Experiment Station, New Orleans, La.

Station No. 267—Phosphate, sent by W. B. Schmidt, New Orleans, La.

Station No. 416—Natural Phosphate, sent by Sugar Experiment Station, New Orleans, La.

Station No. 417—Natural Phosphate, sent by Sugar Experiment Station, New Orleans, La.

Station No. 418—Natural Phosphate, sent by Sugar Experiment Station, New Orleans, La.

ANALYSES OF PHOSPHATES.

Station Number.	Reverted Phosphoric Acid.	Insoluble Phosphoric Acid.	Total Phosphoric Acid.
10	3.15	17.91	21.06
11	10.18	11.89	22.07
17	.....	.....	17.59
19	.....	.....	30.32
267	6.82	7.62	14.44
416	.....	.....	17.27
417	.....	.....	25.48
418	.....	.....	26.76

FISH SCRAP

Is the product obtained by drying and pulverizing the residue left after the extraction of oil from fish and contains in addition to Nitrogen a good proportion of Phosphoric Acid. It is used largely by Eastern manufacturers as a source of Nitrogen for their complete fertilizers and also affords the planter a cheap and available form of Nitrogen. Like many other fertilizing materials of an organic character, its value is greatly enhanced by a fine state of pulverization.

Station No. 16—Sent by Sugar Experiment Station, New Orleans, La.

ANALYSIS OF FISH SCRAP.

	Phosphoric Acid.	Nitrogen.
Station No. 16.....	7.08	9.13

DRIED BLOOD.

A waste product of the slaughter house is found upon the market in two forms, viz: Black Blood and Red Blood. The difference in color is due chiefly to the difference in the temperature employed in drying, the Black Blood having been subjected to a much higher temperature than the red. While Dried Blood contains small proportions of both Phosphoric Acid and Potash, it is valued chiefly for the Nitrogen which it contains, the proportion of this element varying from 8 to 15 per cent. The Red Blood is the more finely divided of the two varieties and has been found to be more prompt in its action than the black.

Station No. 12—Sent by Sugar Experiment Station, New Orleans, La.

ANALYSIS OF DRIED BLOOD.

	Phosphoric Acid.	Nitrogen.
Station No. 12	1.24	9.94

SULPHATE OF AMMONIA

Is one of the most concentrated forms of Nitrogen upon the market. It is obtained by neutralizing the ammoniacal liquors of gas works with Sulphuric Acid and evaporating the solution to dryness. It is used largely as a top dressing for grains, grasses, etc., and is sometimes employed as an ingredient of high grade ammoniated fertilizers. On account of its ready solubility and its susceptibility to loss by leaching, it should be applied only to growing crops, or upon stiff, impermeable soils, avoiding the use of excessive amounts at any one application.

Station No. 6—Sent by Sugar Experiment Station, New Orleans, La.

ANALYSIS.

Nitrogen	20.75
Equal to Ammonia	25.19

NITRATE OF SODA

Is valued for its high Nitrogen content, and is employed extensively as a top dressing for grains, grasses, etc.

It is obtained in large quantities from the nitre beds of Chil and Peru and of recent years the importations have assume large proportions.

In addition to its direct use upon certain crops as a nitro genous manure, it is now frequently employed by manufacturer in compounding high grade complete fertilizers.

Its easy solubility renders it necessary that caution be ob served in its application as a top dressing.

Station No. 5—Sent by Sugar Experiment Station, New Orleans, La.

ANALYSIS.

Nitrogen	14.45 per cen
Equivalent to pure Nitrate of Soda	87.73 per cen

NITRATE OF POTASH.

This substance, variously known as saltpetre or nitre, is ob tained largely from the nitre beds of India and contains a larg proportion of both Nitrogen and Potash.

It is much less employed for fertilizing purposes than th corresponding soda compound, but like that substance, readily susceptible to loss by being washed from the surface b rains, when employed as a top dressing.

Station No. 4—Sent by Sugar Experiment Station, Ne Orleans, La.

ANALYSIS.

Nitrogen	12.88 per cen
Potash	47.12 per cen

KAINITE

Is a crude product of the German salt mines of Stassfurth an Leopoldshall, and consists chiefly of the Sulphates of Potash an Magnesia, and the Chlorides of Magnesium and Sodium. It the form of Potash most frequently met with in the markets this State, though in many cases it is applied without an advantageous results. Its usual proportion of Potash is abo 12 per cent.

KAINITE.

Station No. 7—Sent by Sugar Experiment Station, New O leans, La.

Station No. 407—Sent by Caddo Fertilizer Company, Shreveport, La.

ANALYSES OF KAINITE.

	Potash.
Station No. 7	14.08
Station No. 407	13.08

SULPHATE OF POTASH

Is the costliest form of potash upon the market. It is a refined product of the German mines, but it is quite hard to obtain in a pure state, certain grades being frequently mixed with the muriate.

It is regarded as the most desirable form of Potash for use upon many crops, but on account of the uncertain composition of the commercial article, it should always be bought upon a definite guarantee.

Station No. 2—Sent by Sugar Experiment Station, New Orleans, La.

ANALYSIS.

Potash	55.64

It is quite probable that the high percentage of Potash in this sample is due to admixture with the muriate.

MURIATE OF POTASH

Is another product of the German mines and is chemically known as Potassium Chloride. It contains a much higher proportion of potassium than any of the other commercial forms of this element and is frequently used as an ingredient of complete fertilizers where a high Potash content is desired. The muriate is the cheapest form of Potash, but at the same time is the form least advantageous for general uses.

Station No. 3—Sent by Sugar Experiment Station, New Orleans, La.

ANALYSIS.

Potash	49.55 per cent

LAND PLASTER

Is the commercial Sulphate of Lime, and is used chiefly as a top dressing for clover and other leguminous crops. It is also some-

times employed as a covering for compost or manure heaps. When used as a top dressing its effects are chiefly produced indirectly, it being what is termed a stimulant manure.

Station No. 1—Sent by Sugar Experiment Station, New Orleans, La.

ANALYSIS.

Lime.....31.21 per cent.

COTTON SEED HULL ASHES.

These are produced in quite considerable quantities in the oil mills of the South, where the hulls, removed from the cotton seed, are used for fuel purposes. In the South, where they are exclusively produced, they are least used, being, however, in great demand in the Eastern States where they are employed as a tobacco fertilizer. Their composition is quite variable, the light colored ashes having always a higher Potash content than the dark variety. In addition to their high proportion of Potash, the hull ashes contain quite a good percentage of Phosphoric Acid.

Station No. 18—Sent by Sugar Experiment Station, New Orleans, La.

ANALYSIS.

Phosphoric Acid.....11.25 per cent.

BAT MANURE.

The excrement of bats, when in a pure condition, possesses a high fertilizing value, though the proportions of its fertilizing constituents vary greatly. It contains all three of the chief essential ingredients of a complete fertilizer, though the quantities of each are frequently not advantageously proportioned. Where Nitrogen is the predominant constituent, the bat manure has been found well adapted for use as a top dressing for grains, grasses, clovers, etc.

Station No. 395—Sent by Department of Agriculture, Baton Rouge, La.

ANALYSIS.

Soluble Phosphoric Acid	1.73 per cent.
Reverted Phosphoric Acid	4.96 per cent.
Insoluble Phosphoric Acid	8.99 per cent.
Total	15.68 per cent.
Nitrogen	4.01 per cent.
Equal to Ammonia	4.87 per cent.
Potash	1.13 per cent.

POUDRETTE.

This fertilizer is the product of the treatment of night soils by various processes.

Quite diverse methods have been employed for the preservation and utilization of excrements of this kind for fertilizing purposes and upon the continent of Europe large quantities of the product, bearing the above name, are annually consumed.

The composition of this product varies greatly, being largely influenced by the character and quantity of the material with which it is mixed in the process of preparation. Where a phosphate has been employed as a dryer the fertilizing value is much enhanced and the goods bring a higher price upon the market.

Fertilizers of this description are but little manufactured in this country.

Station No. 325—Sent by Sugar Experiment Station, New Orleans, La.

ANALYSIS.

Soluble Phosphoric Acid	0.22
Reverted Phosphoric Acid	0.85
Insoluble Phosphoric Acid	0.45
Total Phosphoric Acid	1.52
Nitrogen	1.10
Equivalent to Ammonia	1.33
Potash	0.32

WATER.

A sample of water from the plantation of Wogan Bros., St. Charles Parish, La., was sent to the Station Laboratory for analysis during the past spring. The water had been employed for watering stock and it was desired to learn if any deleterious constituents were present. On examination the water was found to contain:

Total solids	44.95 grains per gallon.
Organic and volatile matter	14.05 grains per gallon.

Qualitative tests showed the presence of the following substances, viz: Potassium, Sodium, Magnesium, Calsium, Iron, Chlorine, Sulphuric and Carbonic Acids.

The proportion of organic matter above indicated is excessive and would render unadvisable the continuous use of this water for stock.

PARIS GREEN.

The following law was passed by the Legislature and is given for the guidance of dealers and farmers throughout the State:

ACT NO. 131.

SECTION 1. Be it enacted by the General Assembly of the State of Louisiana, That the Bureau of Agriculture shall be charged with the duties of regulating the sale and purity of Paris Green as an insecticide in this State.

SEC. 2. Be it further enacted, etc., That it shall be the duty of any manufacturer or dealer in original packages of Paris Green before the same is offered for sale in this State, to submit to the Commissioner of Agriculture a written or printed statement setting forth, First: the brands of Paris Green to be sold, the number of pounds contained in each package in which it is to be put upon the market for sale and the name or names of the manufacturers and the place of the manufacture. Second: the statement setting forth the amount of arsenic which they are willing to guarantee the said Paris Green to contain and the statement so furnished shall be considered as constituting a guarantee to the purchaser that every package of said Paris Green contained not less than the amount of arsenic set forth in the statement.

SEC. 3. Be it further enacted, etc., That every purchaser proposing to deal in Paris Green shall, after filing the statement above provided for with the Commissioner of Agriculture, receive from the said Commissioner of Agriculture a certificate stating that he has complied with the foregoing section, which certificate shall be furnished by the Commissioner without any charge therefor; that said certificate when furnished shall authorize the party receiving the same to deal in this State in

Paris Green; that no person who has failed to file the statement aforesaid and to receive the certificate of authority aforesaid, shall be authorized to deal in this State in Paris Green, and any person so dealing in this State without having filed the aforesaid statement and received the certificate aforesaid shall be liable for each violation to a fine not exceeding $250, which fine shall be recoverable before any court of competent jurisdiction, at the suit of the Commissioner of Agriculture or of any citizen, and shall be disposed of as hereinafter provided; provided further, that nothing in this section shall be construed as preventing the sale by retail dealers throughout the State of Paris Green which has already been guaranteed and labeled, as provided for in this act.

SEC. 4. Be it further enacted, etc., That it shall be the duty of the Board of Agriculture, or its commissioner at the opening of each season to issue and distribute circulars setting forth the brands of Paris Green, their percentages of arsenic as claimed by the dealers and to more particularly describe them they shall be separated into two classes, viz: First, those brands containing 50 per cent. or more of arsenic shall be classed as "strictly pure," and Second, all falling below this percentage, shall be classed "impure."

SEC. 5. Be it further enacted, etc., That it shall be the duty of the Commissioner of Agriculture to cause to be prepared labels of suitable material; fitted to be attached to packages of Paris Green and to have printed thereon, "Guaranteed," with a blank space into which may be stamped by the Commissioner of Agriculture the words "strictly pure," or "impure," as the guarantee may require, also the year or season in which it is to be used, and a fac simile of the signature of said Commissioner. The said labels shall be furnished by the said Commissioner to any dealer in Paris Green, who shall have complied with the foregoing provisions of this act, upon the payment by said dealer to said Commissioner of fifty cents for a sufficient number to label one hundred pounds of said Paris Green.

SEC. 6. Be it further enacted, etc., That it shall be the duty of every person before offering for sale any Paris Green as an insecticide in this State to attach or cause to be attached to each package one of the labels herein feebordescribed, designat-

ing the quantity of Paris Green in the package to which it is attached. Any person who shall sell any packages of Paris Green, or any part thereof, which has not been labeled as herein provided for shall be guilty of a misdemeanor and on conviction thereof shall be fined in the sum of one hundred dollars for each omission, which penalty may be sued for either by the Commissioner of Agriculture or any person for the uses hereinafter declared. Any person who shall counterfeit, or use a counterfeit label prescribed by this act, or who shall use them a second time, shall be guilty of a misdemeanor and on conviction thereof shall be fined in a sum not exceeding two hundred and fifty dollars, one-half of which shall be paid to the informer, which fine may be doubled or trebled at each second or third conviction, and so on progressively for subsequent convictions.

SEC. 7. Be it further enacted, etc., That it shall be the duty of every person who sells a package of Paris Green, upon the request of the purchaser to draw from the same and in the presence of the purchaser or his agent a fair and correct sample and to have the same securely enclosed and sealed and sent to the Commissioner of Agriculture for analysis by the Official Chemist of the State, and if upon analysis the said Paris Green shall be found below the guarantee given to the Commissioner of Agriculture and printed on the package, then the said seller shall be liable to said purchaser for all damages accruing from said difference, recoverable in any court of competent jurisdiction in the State.

SEC. 8. Be it further enacted, etc., That the copy of the Official Chemist's analysis of any Paris Green certified to by him shall be admissible as evidence in any court of the State on trial of any issue involving the merits of said Paris Green.

SEC. 9. Be it further enacted, etc., That the Bureau of Agriculture shall adopt needful rules and resolutions providing for the collection of the money arising from the sale of labels, or from any fines imposed under this act and shall deposit the same with the Treasurer of the State.

PARIS GREEN

Is largely used in this State as an insecticide, chiefly for the destruction of the cotton caterpillar, whose ravages are frequently so injurious. This chemical consists chiefly of the "Ar-

senite of Copper," with a small proportion of the Acetate of Copper, and a first-class article should contain not less than 50 cent. of arsenious acid, known in its pure state as white arsenic.

This article is so frequently adulterated that the Legislature passed a law for the protection of consumers. Before the passage of this law, several samples were analyzed by the Station and found to contain no arsenic whatever. Even since the passage of this act several brands are on the market containing only one half of the normal amount of arsenic which ought to be found in good Paris Green. This act was passed in the interest of planters and farmers, to protect them against adulterated and low class goods, and every one of them can avail themselves of its provisions.

Before buying Paris-Green every planter should inspect the packages and see that "Strictly Pure" and "Guaranteed," with the fac simile of the signature of the Commissioner of Agriculture are stamped on each. In this way spurious and low grade goods will be driven out of our markets.

The following is the method followed in this laboratory in the estimation of arsenious acid in Paris Green :

Weigh up one gram, place in beaker and add 30 cubic centimetres of hydrochloric acid ; add a slight quantity of finely powdered potassium chlorate and heat over a water bath at a temperature below the boiling point of water, adding very small portions of the potassium chlorate at intervals, stirring well after each addition. Continue heating until the free chlorine has been expelled ; dilute and filter, if insoluble matter be present. Add slight excess of ammonium hydrate, cool and add magnesia mixture in small excess, stirring vigorously. Allow to stand for 12 hours, filter and wash with dilute ammonia solution. Dry well, separate the precipitate as nearly as possible from filter paper and burn the latter, having previously moistened it with ammonium nitrate solution. Place the precipitate in a porcelain crucible and heat first for several hours on iron plate and afterwards directly over the flame, add filter ash to contents of crucible and weigh as magnesium pyro-arsenate.